Two new species of Sea Anemones (Actiniaria) from Maharashtra

BY

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(*With four text-figures*)

Two new species of sea anemones, namely *Anemonia indicus* and *Acontiophorum bombayensis*, from Maharashtra have been described. The description of each species is based on size-range, coloration, internal anatomical features and size and distribution of nematocysts.

The paper describes two new actinians from a collection of sea anemones made along the coast of Maharashtra, during 1966-67. The specimens were collected from the intertidal region and the observations on nematocysts were made on living material. The anatomical features were studied by dissections and serial sectioning.

Carlgren's (1949) classification is followed and the description of nematocyst types is based on Cutress (1955).

Anemonia indicus sp. nov.

(Text-figs. 1 & 2)

Material. Holotype (Reg. No. P. 1835/1) in the collections of the Zoological Survey of India, Calcutta, collected at Malvan, Ratnagiri District, Maharashtra in March 1966. Paratypes : Fifteen specimens collected from Bombay, Ratnagiri, Vengurla and Redi along the coast of Maharashtra. These will be deposited in the collections of the Zoological Survey of India, Calcutta and the Bombay Natural History Society.

Diagnosis. Actiniidae with wide pedal disc and smooth body, provided with marginal spherules, which are, sometimes absent in the smaller individuals. Sphincter weak, circumscribed or rather well-developed, diffuse. Tentacles usually long, as a rule not covered by the upper part of the column, their longitudinal muscles ectodermal. Siphonoglyph variable in number, not always connected with directives. Numerous perfect mesenteries. Diffuse retractors. More mesenteries at the base

than at the margin. Cnidom : Spirocysts, atrichs, basitrichs, microbasic p-mastigophores (and possibly sometimes, holotrichs).

Description

General features. *Anemonia indicus*, is a medium-sized, soft-bodied actinian. In life, the column is pillar-or hour-glass-like in form. The anemone is most frequently found attached to oyster shells and occasionally to the tube of the polychaete, *Onuphis* sp., shells of the bivalve *Coecella* sp. as well as to submerged concrete structures. Solitary to gregarious in habit. Algae present in the endoderm.

Size. The species has the following size-range : Length of the column 15-75 mm., diameter of column 10-15 mm., diameter of oral disc 20-60 mm., diameter of basal disc 20-60 mm.

Colour. Column green with brown longitudinal stripes. Oral disc and tentacles light-green with radial and transverse brown stripes. Basal disc dirty-white in preserved anemone. Some specimens have darker shades of green and brown.

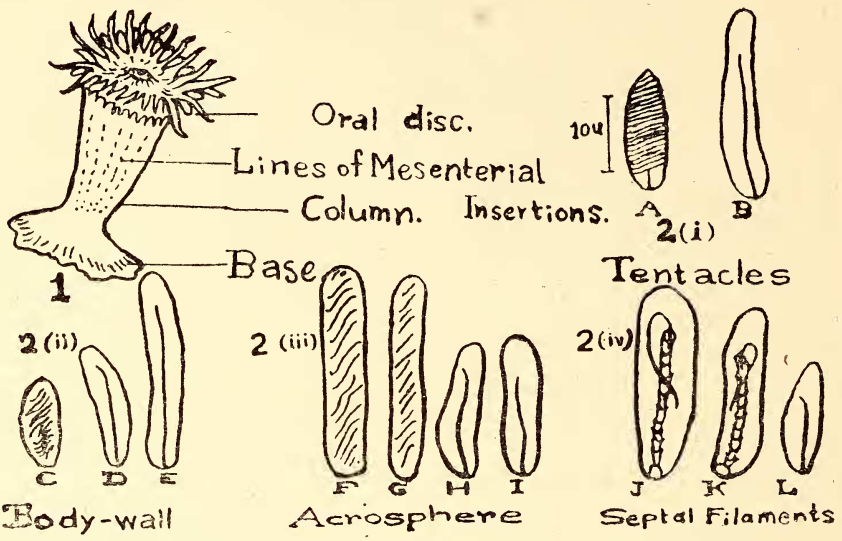
Basal Disc. Strongly adherent, well-developed and generally circular in outline, the diameter equal to that of the oral disc but always more than that of the column. Basal disc translucent in the living anemone.

Column. Not divisible into scapus and capitulum, pillar-like when extended, sometimes hour-glass-like. A deep fosse present. Column smooth, semi-transparent and without cinclides. Longitudinal lines of mesenterial insertions are clearly visible through the body-wall.

Oral Disc. Large, flat to concave, wider than the diameter of the column. Regular in outline with a beautiful design formed by the radial dark green or brownish stripes. Lips ribbed, sometimes raised to form a cone above the surface of the disc. Two siphonoglyphs present. Mouth of moderate size and non-protuberant. Radial muscles of the disc, ectodermal.

Tentacles. Up to 192 in a full grown anemone. Long, thin and tapering to a point. Tentacular arrangement is regularly hexamerous. Six cycles of 6, 6, 12, 24, 48, 96 tentacles in a full grown specimen. Marginal spherules (acrosphere) present, but in young specimens they may be less developed or absent. In some, the spherules are lobed. Inner tentacles longer than the outer ones. V-shaped green or brownish marks, on the surface alternating with white patches on the wall facing the oral region. Longitudinal muscles ectodermal.

Mesenteries. Many, perfect mesenteries not divisible into macro- and microcnemes. Retractors fairly strong and diffuse. Well-developed parietal muscles. Sphincter well-developed and diffuse. In section the sphincter is broadest at margin and gradually tapers to a tail. Mesenteries developing from the base. Sexes separate.



Text-fig. 1. *Anemonia indicus* sp. nov., a well developed specimen.

Text-fig. 2. Cnidom of *Anemonia indicus* sp. nov. (i) *Tentacles* : (A) Spirocysts (B) Basitrichs ; (ii) *Body-wall* : (C) Atrichs (D) Basitrichs (E) Basitrichs ; (iii) *Acrosphere* : (F) Atrichs (G) Spirocysts (H) Basitrichs (I) Basitrichs ; (iv) *Septal Filaments* : (J) Microbasic p-mastigophores (K) Microbasic p-mastigophores (L) Basitrichs.

Cnidom. The distribution and size (in μ) of nematocysts are as follows:

Tentacles :	
Spirocysts (A)[1]	9·8 - 19·6 × 1·4 - 2·8
Basitrichs (B)	18·2 × 2·1 - 2·8
Body-wall :	
Atrichs (C)	8·1 - 11·2 × 1·4 - 2·1
Basitrichs (D)	14 - 18·2 × 2·1 - 2·8
Basitrichs (E)	22·4 - 23·8 × 4·2
Acrosphere :	
Atrichs (F)	29·4 - 49 × 2·8 - 4·2
Spirocysts (G)	14 - 15·4 × 2·1 - 2·8
Basitrichs (H)	14·7 - 21 × 2·1
Basitrichs (I)	9·8 - 11·2 × 1·4
Septal filaments :	
Microbasic P-mastigophores (J) ..	18·2 - 21 × 3·5
Microbasic P-mastigophores (K) ..	12·6 - 14 × 4·2
Basitrichs (L)	8·4 - 9·8 × 1·4

[1] Reference to text-figures.

Remarks. Amongst the 8 species of the genus *Anemonia*, recorded so far, only *Anemonia natalensis* Carlgren (1938) bears some resemblance to this species but the distribution, size, and form of nematocysts are clearly different from *A. natalensis*.

Acontiophorum bombayensis sp. nov.

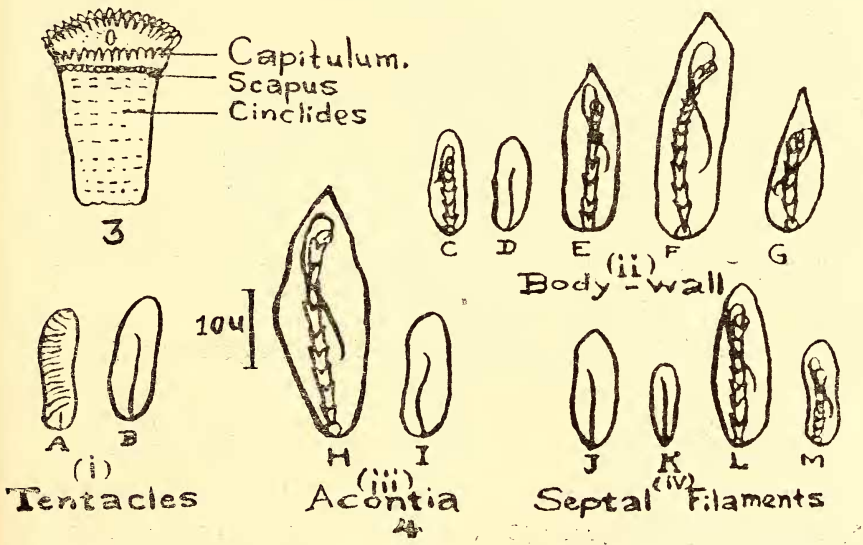
(Text-figs. 3 & 4)

Material. Holotype (Reg. No. P. 1834/1) in the collections of the Zoological Survey of India, Calcutta, collected at Madh Island, Bombay City, Maharashtra, in October 1966. Paratypes : Five full grown specimens from the same locality which will be deposited in the collections of the Zoological Survey of India and the Bombay Natural History Society.

Diagnosis. Acontiophoridae with well-developed base. Column smooth, cinclides present. No sphincter. Tentacles of ordinary length, hexamerously arranged. Longitudinal muscles of tentacles and radial muscles of oral disc, ectodermal. Two siphonoglyphs. Mesenteries divisible into macro- and microcnemes, more numerous proximally than distally. Two pairs of directives. Macrocnemes, including the directives, fertile, with very strong retractors. Parietobasilar muscles very weak. Basilar muscles distinct. Cnidom : spirocysts, basitrichs, microbasic p-mastigophores and probably microbasic amastigophores.

Description

General features. A very small sized anemone. When alive, the extended column is cylindrical. The anemone usually lives in association with the wood boring mollusc, *Martesia* sp. but also occurs on the shell



Text-fig. 3. *Acontiophorum bombayensis* sp. nov., a well developed specimen.

Text-fig. 4. Cnidom of *Acontiophorum bombayensis* sp. nov. (i) *Tentacles* : (A) Spirocysts (B) Basitrichs (ii) *Body-wall* : (C) Microbasic p-mastigophores (D) Basitrichs (E) Microbasic p-mastigophores (F) Microbasic p-mastigophores (G) Microbasic p-mastigophores (iii) *Acontia* : (H) Microbasic p-mastigophores (I) Basitrichs (iv) *Septal Filaments* : (J) Basitrichs (K) Basitrichs (L) Microbasic p-mastigophores (M) Microbasic p-mastigophores.

of the barnacle, *Balanus tintinnabulum*. Gregarious due to asexual reproduction by pedal lacerations. Algae present in the endoderm. An uncommon to rare species.

Size. The largest, well-extended specimen has the following dimensions. Length of the column 18 mm., diameter of column and basal disc 10 mm., diameter of oral disc 15 mm.

Colour. Column and oral disc green. Capitulum translucent to light-green. Cinclides on the column, dark green, but at times, yellowish or even light-red. Tentacles light-pink. Basal disc dirty-white.

Basal Disc. Moderately adherent, well-developed and almost circular in outline. Diameter equal to that of the column but sometimes smaller.

Column. Short, columnar when fully expanded. Divisible into scapus and capitulum. Column studded with longitudinal rows of coloured cinclides. Capitulum without cinclides. Acontia not readily discharged.

Oral Disc. Flat, broader than column when expanded. Radial muscles of disc and longitudinal muscles of tentacles, in the ectoderm. Two siphonoglyphs. Mouth protuberant. Tentacles cover more than peripheral one-third of the disc.

Tentacles. 3-4 cycles, arranged hexamerously. Short, smooth with rounded tips. All tentacles of more or less equal size. Longitudinal muscle layer of tentacle, when contracted, thrown into prominent folds.

Mesenteries. Two cycles of perfect mesenteries, with well-developed diffuse to circumscribed retractors in the distal region. Parieto-basilar muscles well-developed. Mesenteries developing from base upwards. Algae (zooxanthellae) present in the whole column and mesenteries. Sphincter absent. Acontia short, thick and light-pink in colour, elliptical in transverse section and without fin. Acontia more than twice as thick as filaments and containing few nematocysts and numerous gland cells. Nematocysts of acontia are distinctly larger than those of filaments. Asexual reproduction by pedal lacerations.

Cnidom. The distribution and size (in μ) of nematocysts are as follows:

Tentacles :	
Spirocysts (A)[1]	8·4 - 21 × 2·1 - 4·2
Basitrichs (B)	15·4 - 18·2 × 2·1 - 2·8
Body-wall :	
Microbasic P-mastigophores (C) ..	16·8 - 19·6 × 2·8 - 4·9
Basitrichs (D)	9·8 - 15·4 × 1·4 - 2·1
Microbasic P-mastigophores (E) ..	19·6 - 23·8 × 4·2 - 4·9
Microbasic P-mastigophores (F)	28 × 4·2
Microbasic P-mastigophores (G) ..	16·8 - 19·6 × 2·8 - 3·5

[1] Reference to text-figures.

Acontia :

Microbasic P-mastigophores (H)	33·6 - 42 × 5·6 - 7·7
Basitrichs (I)	16·8 × 1·4 - 2·1

Septal filaments :

Basitrichs (J)	15·4 - 18·2 × 2·8 - 3·5
Basitrichs (K)	5·6 - 7 × 1·4
Microbasic P-mastigophores (L)	28 - 33·6 × 3·5 - 5·6
Microbasic P-mastigophores (M) ..	7 - 8·4 × 1·4

Remarks. The genus *Acontiophorum*, has so far been represented by a single species, *Acontiophorum mortenseni* Carlgren, reported from South Africa (Carlgren 1938). From the distribution and shape of nematocysts, there is no doubt that the new species, belongs to the genus *Acontiophorum*. The distribution and size of the nematocysts of *A. bombayensis* are different from those of *A. mortenseni*.

Acknowledgements

Thanks are due to Shri J. C. Daniel, Curator, Bombay Natural History Society, for providing facilities and taking interest in this work and to Dr. Ch. E. Cutress, Puerto Rico University for assistance in the identification of the material. The author is indebted to the Council of Scientific and Industrial Research, for the award of a Senior Research Fellowship.

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